NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE SPECIFICATION

SHALLOW WATER DEVELOPMENT AND MANAGEMENT (Ac.) CODE 646

General Specifications

Water control structures shall meet the requirements of NRCS Conservation Practice Standard 587, "Structure for Water Control". Although several types of water control structures are available, flashboard risers made of steel, corrugated metal or PVC are commonly used to vary the water levels on fields by installing or removing boards. Flashboard risers are generally preferred to other types because they are self-regulating once the proper elevation of the boards in the intake structure has been set. Also they may function as drainage pipes (provided the structure is sized correctly) when the boards are removed so there is no interference with agricultural operations. Structures constructed of steel pipe are more expensive initially than corrugated metal; however steel requires little maintenance and has a longer life expectancy. PVC structures also have long life and are less costly than steel, but can be damaged by farm equipment and/or fire. Tongue and groove flashboards made of PVC do not swell like wooden boards, allowing ease of operation.

Landowners shall obtain local, state, and federal permits necessary.

The Standards and Specifications for Dike (356), Pumping Plant for Water Control (533), and Structure for Water Control (587) will be used as appropriate. Refer to Chapter 6, "Structures", of Part 650 in the National Engineering Handbook for additional design information. Existing drainage systems will be utilized, removed, or modified as needed to achieve the intended purpose.

To insure that foods are available to dabbling ducks, impoundments should be gradually flooded to a depth of 6 – 18 inches. Wading birds generally utilize 3 – 5 inches of water. Shore birds generally require mudflats or shallow water averaging 2 inches or less. Although most wetland dependent wildlife uses shallow water areas to some extent regardless of size, large complexes (containing small grains, native vegetation, scrub/shrub wetlands, forested swamps, etc.) provide greater benefits. Continuous disturbances adversely affect most bird use, therefore maintaining at least 25% of the managed area as a sanctuary could increase use. Sanctuary areas provide protection, resting, preening, and loafing areas, in addition to forage.

HABITAT MANIPULATION

Although shallow water wetland systems are among the most productive ecosystems in terms of total biomass, few wetland dependant species, especially bird species, acquire substantial energy or nutritional resources directly from plant material consumption other than seeds. Much of the energy from plants is transferred to primary consumers, including a diverse group invertebrate species. Manipulating water levels not only directly affect invertebrate populations, but also indirectly affect other fauna through modification of aquatic plant communities. Varying water levels influences germination, seed or tuber production and maturation and plant structure.

Agricultural Fields

Small grain fields such as rice can provide important habitat for waterfowl and other wildlife. It is estimated that per acre; 150+ pounds of rice, 50+ pounds of soybeans, 180+ pounds of corn, and 130+ pounds of grain sorghum are lost during harvest. These fields can provide substantial food

resources if they are not repeatedly disked or plowed after harvest, and shallowly flooded. Rice fields are among the most economical areas to manage for waterfowl, shore birds, and wading birds, because the existing levees and structures can be used, and the stubble can be lightly disked, rolled, or water buffaloed prior to flooding. The procedure of manipulating rice stubble prior to flooding aids in decomposition, which increases invertebrate populations. Not only does this enhance the area for wildlife, but also results in fields that are cleaner when the water is drained in the spring for seedbed preparation. Waterfowl feeding in rice fields also reduce the occurrence of red rice (*Oryza sativa*) and other weeds for the following production cycle. Small grains decompose at varying rates when flooded. Rice, sorghums, and corn persist for extended periods but soybeans deteriorate rapidly. At least 10% of the area should be flooded in August to mid September to a depth of 2 – 6 inches to provide habitat for early migrants. Waterfowl and other water birds benefit most when water levels are increased gradually rather than immediately inundating the entire area. By increasing water levels in 6-inch increments, new areas are flooded and additional food sources gradually become available. This procedure conserves food for later in winter and provides a range of water depths, which benefits a wider array of wildlife. Fields should be completely flooded by December 15 and maintained until the following year just prior to seedbed preparation. When dewatering the area, it should be completed gradually (6 inch increments) to concentrate invertebrate food resources.

Moist Soil Areas

Moist soil areas are important because of the great diversity of foods. In addition, seasonally flooded moist soil areas tend to harbor greater densities of invertebrates than do habitats that are permanently flooded. Important factors when managing moist soil areas are the timing of the annual drawdown, and the frequency of soil disturbance to alter plant succession. Mid to late season drawdowns generally favor millets (*Echinochloa* and *Leptochloa* sp.) and preferred grasses (*Panicum* sp.). Total seed production however, is generally greater when impoundments are drained early to mid season. Early drawdowns occur within the first 45 days of the growing season, mid-season drawdowns occur within the second 45 days of the growing season, and late season drawdowns occur within the remainder of the growing season. While slow drawdowns typically produce diverse vegetative cover, fast (less than 2 weeks) drawdowns are more likely to result in a stand of similar vegetation. To maximize benefits, units should be drained at varying times and rates if able. For maximum seed production, native plant communities must be maintained in an early successional stage. The percentage of non-food producing plant species generally tends to increase in each consecutive year the area is not disturbed. Soil disturbance greatly affects the response of native plants to different management techniques. Impoundments should be disked at 2 – 3 year intervals to set back succession and control invasion by undesirable plants. Vegetative succession manipulations should not be more frequent than every two years unless problems with undesirable plants begin. Manipulations every year have the potential to reduce beneficial food plant communities. Plants such as cocklebur (*Xanthium* sp.) and coffeeweed (*Sesbania* sp.) can quickly develop a closed canopy and out-compete desirable plants. If undesirable plants invade 50% or more of the managed area, control by either approved herbicides, disking, shredding, flooding, and/or prescribed burning is warranted.

Food Plantings

Fields can be planted with small grains such as Japanese millet, Chiwapa millet, browntop millet, corn, and rice. These plants typically produce high yields of seed and are eaten by many birds and most waterfowl. Soybeans are not recommended for use in shallow water because they deteriorate quickly once flooded. Consult applicable NRCS conservation practice standards for seeding rates, planting dates, and management practices.

REFERENCES

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